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EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT

PAPER NUMBER

1774

DATE MAILED: 01/15/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/630,407

Applicant(s)
Takanobu NOGUCHI et al.

Examiner
M. Yamnitzky

Art Unit
1774



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Aug 1, 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 8-14 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 20) ☐ Other: _____

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1. The disclosure is objected to because of the following informalities:

The specification contains numerous grammatical errors. Some of the corrections are self-evident and can be made by informal examiner's amendment. However, the appropriate changes for the last full sentence on page 51 ("The polymer binder mixed...is suitably used.") are not clear to the examiner.

The second full paragraph on page 22 is confusing because there is no Ar_2 in formula (3) and there is no Ar_3 in formula (4).

Appropriate correction is required. Depending upon the correction made to the second full paragraph on page 22, note that changes may also be necessary to the third full paragraph on page 22 and the paragraph bridging pages 22 and 23 since these paragraphs refer to Ar_2 and Ar_3 .

2. Claims 8-14 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, these claims have not been further treated on the merits.

3. Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the specific polymers set forth in the examples and for EL devices comprising these specific polymers, does not reasonably provide enablement for the full scope of polymers and EL devices encompassed by the present claims. The specification does not enable

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any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The repeating units required by the present claims encompass thousands of different possibilities. The claims require a copolymer containing at least two different repeating units (in the case of claim 1 and dependents) or at least three different repeating units (in the case of claim 2 and dependents) wherein some of the different repeating units are selected based upon the absorption edge wavelengths of the polymers made solely of the individual repeating units.

The specification sets forth ten examples of specific copolymers containing two different repeating units. The ten examples utilize seven examples of repeating units of formula (1) as set forth in claim 1 and three examples of repeating units of formula (3) as set forth in claim 1. The specification does not contain any specific examples of copolymers containing three or more different repeating units.

Other than the specific combinations of repeating units used for the copolymers of the examples, the specification does not provide any guidance as to what possible combinations of repeating units selected from the myriad of possibilities within the scope of the formulae set forth in the claims can reasonably be expected to meet condition (c) as set forth in claim 1 or condition (f) as set forth in claim 2. The specification does not contain any general guidance as to how different arylene groups, heterocyclic compounds and substituents affect the absorption edge wavelength of a polymer such that one of skill in the art could reasonably predict the absorption

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edge wavelength of a polymer of a specific repeating unit relative to a polymer of a different specific repeating unit.

It is the examiner's position that the specification does not enable any person skilled in the art to make and use the invention commensurate in scope with the claims because one of skill in the art would have to make the polymers of various individual repeating units within the scope of the claims and then determine the absorption edge wavelength of each of the polymers in order to determine which combinations of repeating units meet the limitations of the claims. Given the thousands of different repeating units within the scope of the formulae set forth in the claims, it is the examiner's position that undue experimentation would be required on the part of one of skill in the art to make and use the invention commensurate in scope with the claims.

4. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "contains each one or more of repeating units" (line 4 of claims 1 and 2) is grammatically confusing. It is not certain what is meant by this phrase.

The use of the term "respectively" (line 6 of claims 1 and 2, and the second and third lines from the end of claim 3) is confusing. The term "respectively" is generally used to indicate a direct correlation between the members of two different groups. For example, the phrase "A and

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B are 1 and 2, respectively” means that A is 1 and B is 2. In the present case, it is not clear what is being correlated by the term “respectively”.

Claim 2 is an independent claim drawn to a polymeric fluorescent substance comprising repeating units represented by formulae (1), (3) and (4). Only the structure associated with formula (4) is set forth in this claim. The structures of the repeating units of formulae (1) and (3) are not set forth in claim 2 thus rendering claim 2 and claims dependent therefrom incomplete.

5. Miscellaneous:

As a grammatical correction, “having” should read --has-- in line 2 of claims 1 and 2.

In claim 3, the phrase “the group represented by the formula (5) has at least one substituent other than a hydrogen atom, and when the group (5) has a plurality of substituents, they may be the same or different” is superfluous. The limitation that “the group represented by the formula (5) has at least one substituent other than a hydrogen atom” is inherently set forth in the earlier recited limitations requiring at least one of X_1 to X_{12} to be C- R_7 and at least one R_7 to be a group other than a hydrogen atom. The limitation that “when the group (5) has a plurality of substituents, they may be the same or different” is inherently set forth in the earlier recitation “when a plurality of R_7 ’s are present, they may be the same or different”.

As a grammatical correction, “an” should read --a-- in lines 2 and 4 of claim 6.

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6. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Doi et al. (US 5,759,709), Inbasekaran et al. (US 5,777,070), Jin et al. (US 6,124,046) and Kim et al. (SPIE Vol. 3148) disclose copolymers containing at least one repeating unit within the scope of formula (1) and at least one repeating unit within the scope of formula (3) as set forth in present claim 1. For example: see the Doi patent at column 19, line 51 through Table 6, especially H7 and H8 in Table 6; see Examples 2-7 in the Inbasekaran patent; see the last formula in Fig. 1 in the Jin patent; see Fig. 1 on page 152 of the Kim article. The repeating units of the prior art copolymers meet condition (a), but do not meet condition (b) as set forth in claim 1. The examiner is unable to determine whether the repeating units of the prior art copolymers meet condition (c).

Zhang et al. (SPIE Vol. 3148) disclose copolymers containing at least one repeating unit within the scope of formula (1) and at least one repeating unit within the scope of formula (3) as set forth in present claim 1. See the second, third, fourth and fifth formulae shown in Figure 1 of the Zhang article. The repeating units of these copolymers meet condition (a). Based on the absorption data presented in Table 1 and Figure 3 of the article, it is the examiner's position that it is reasonable to expect that at least the repeating units of PTPQ (the fourth formula in Figure 1) also meet condition (c). However, the prior art copolymers do not meet condition (b).

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7. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (703) 308-4413. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax numbers for Art Unit 1774 are (703) 872-9311 for official after final faxes and (703) 872-9310 or (703) 305-5408 for all other official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (703) 872-9041.)

MRY
01/14/02



MARIE YAMNITZKY
PRIMARY EXAMINER

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